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purposes in road-making is fully treated. We presume the chemistry and technology of cements have been fully treated in other works by the same author; but we think the omission in the present work of this subject has been a mistake, as many problems in road construction depend for their successful solution upon a thorough and discriminating knowledge of the nature and quality of the cements that are upon the market.

Another defect of the work of a more serious nature, arises from the attempt of an engineer to discuss problems that do not pertain to engineering. We refer to the entire discussion of the subjects embraced in Chapter XIII. This work is published in 1903, yet a careful examination of the entire chapter fails to disclose anything more recent than about two years, and most of it is ten years old. The chapter is evidently written up 'from the book,' instead of from actual experience and personal knowledge; hence the discussion proceeds without discrimination.

It is not to be expected that an author will discuss all subjects equally well; but it is to be regretted that in a work furnishing in other respects so much material of permanent value, this important subject of asphalt pavement should be discussed in such a manner as to be often misleading and generally of but little worth.

While the work will greatly aid the builders of city streets, we believe it will especially commend itself to that larger body of intelligent men who are at this time interested in the improvement of country roads, and to them we commend its careful perusal.

S. F. PECKHAM.

SCIENTIFIC JOURNALS AND ARTICLES.

THE March number of the *Biological Bulletin*, Volume IV., No. 4, contains the following papers:

W. M. WHEELER and J. F. MCCLENDON: 'Dimorphic Queens in an American Ant (*Lasius latipes* Walsh).'

RALPH S. LILLIE: 'Fusion of Blastomeres and Nuclear Division without Cell-division in Solutions of Non-electrolytes.'

CHARLES T. BRUES: 'The Structure and Significance of Vestigial Wings among Insects.'

S. J. HOLMES: 'Death-Feigning in Terrestrial Amphipods.'

EDMUND B. WILSON: 'Notes on the Reversal of Asymmetry in the Regeneration of the Chelae in *Alpheus heterochelis*.'

FLORENCE PEEBLES: 'A Preliminary Note on the Position of the Primitive Streak, and its Relation to the Embryo of the Chick.'

THE principal contents of the *National Geographic Magazine* for March include 'The Canadian Boundary,' by John W. Foster, ex-Secretary of State (a review of the methods by which the line has been adjusted and marked); 'Mountains of Unimak Island, Alaska,' by Ferdinand Westdahl; 'Opening of the Alaskan Territory,' by Harrington Emerson; 'The Forests of Canada,' 'Work in the Far South,' 'The Development of Cuba,' 'Theories of Volcanic Action.' Geographic notes and literature.

SOCIETIES AND ACADEMIES.

GEOLOGICAL SOCIETY OF WASHINGTON.

At the 139th meeting of the society, held in the assembly hall of the Cosmos Club, Wednesday evening, February 25, 1903, an important discussion on the 'Genetic Classification of Ore Deposits,' begun on January 14, was continued.

Mr. Emmons, in opening the discussion, remarked that the classification of ore deposits on a purely genetic basis had been proposed, not as a practical classification, or one that could at the present day be anything more than tentative, but mainly for the purpose of bringing out the theoretical views to which various workers had arrived as the result of their studies. It seemed, therefore, important to distinguish what was purely speculative from what had actually been demonstrated. Messrs. Weed and Spurr, who had opened the discussion, ascribed an importance to igneous agencies which probably would not be admitted by a large class of workers in the field, especially as applied to certain deposits given as types of one or the other of their classes. This application seemed based on speculation rather than on actual demonstration. The important question seemed to be the capability of igneous magmas to supply

the amount of water necessary for the formation of ore deposits as they are found in nature. Professor Kemp has been a strong advocate of the affirmative side of this question.

Professor J. F. Kemp, continuing the discussion, said: "In the establishment of types of ore deposits we should seek certainties as much as possible, and avoid cases which admit of difference in interpretation. If we use source and method of introduction of material as a fundamental principle, we shall do well in doubtful cases to fall back on points of geological structure, since, regarding the facts of the latter, there can seldom arise uncertainty. As well-established types we have at one extreme magmatic segregation from igneous magmas; at the other extreme, placers and residual concentrates produced by water. Starting now with contact deposits, produced especially by the action of eruptives on limestone and from pegmatites, which are assured after-births of vulcanism, we may proceed through the various types of ore bodies to an extreme produced by meteoric waters. Mr. Weed has done a valued service in emphasizing the igneous causes, and surely no one who appreciates the huge garnet zones and the amount of silica contributed to them by the eruptive, can fail to see in the eruptive itself a rich source of quartz for veins. When we appreciate further, as Mr. Lindgren has shown for the gold deposits of North America, that their formation was intense, relatively brief and local, and that it followed the outbreak of eruptions in each case, and that geological periods and even eras passed without vein formation, we must attribute great efficiency to the eruptive rock. The dryness of deep mines, now that it is realized, has greatly restricted our old ideas of the amount of meteoric ground-water. The tendency, therefore, to emphasize igneous agents is well justified, and is a distinct advance."

Mr. T. A. Rickard referred to the want of unanimity concerning the origin of ores, and stated it as his belief that no scheme of classification would be generally adopted while authoritative geologists remained so wide apart in their conclusions. He pointed out that the

trend of opinion had favored igneous or aqueous agencies at different periods in the history of the subject, and that a gradual compromise of views seemed to be the inevitable outcome.

In Colorado it is a remarkable fact that the profitable mines are distributed through every geological terrain, from the Archean granite to a Tertiary conglomerate, and mining is going on in rocks belonging to all the principal subdivisions of geological time and amid a variety of petrographic environment which includes nearly all of the principal sedimentary and crystalline rocks. In arriving at the age of the country enclosing these lodes it has frequently been difficult to consider the sedimentary apart from the intrusive igneous rock and it is not too much to say that there is not a mining district, among the sixty-five which he has tabulated, in which igneous rocks do not occur in close association with the ore deposits.

Mr. F. L. Ransome, while not denying that pneumatolysis might be an effective factor in ore deposition, considered that the genetic classifications recently presented to the society carried this suggestive hypothesis further than facts warrant. He illustrated some of the objections to the extreme views of the igneous school of ore-deposition by reference to the occurrence of ores in the Mother Lode district of California, the San Juan and Rico districts in Colorado, and the Globe and Bisbee districts in Arizona. It was pointed out that the important ore-bodies of these districts were formed after the neighboring eruptive rocks had solidified, and that pneumatolysis, so far as known masses of igneous rock were concerned, was not directly active in ore-genesis. His own experience led him to regard the action of heated water, probably for the most part of meteoric origin, as the most generally effective agent in the formation of the greater number of ore-bodies, as we know them.

Professor C. R. Van Hise stated that in order to get a proper perspective for the appreciation of differences of view, it would be well first to give a summary of points of agreement. Attention was called by the speaker to the fact that, in his paper published

two years ago, upon 'Some Principles Controlling the Deposition of Ores,' it was stated that the metals of some ores are derived directly from adjacent igneous rocks; that the igneous rocks are the ultimate source of all the metals of ore deposits; that igneous rocks have an influence upon ore deposits by contributing metals and solutions to them, and a very important effect in heating solutions of meteoric origin.

As a basis for discussion the following provisional genetic classification was submitted:

Metallic Ore Deposits.	(A) Sedimentary.	(a) Chemical precipitates.	{	(1) Residuary deposits.
		(b) Mechanical concentrates.		(2) Stream deposits.
	(B) Igneous. {Magmatic segregations.			(3) Beach deposits.
	(C) Metamorphic.	(a) Ores deposited from gaseous solution.	{	(1) Ascending waters.
		(b) Ores deposited from aqueous solution.		(2) Descending waters.
				(3) Ascending and descending waters.

The classing of a large proportion of ores as pneumatolytic, fumarolic, solfataric and pneumato-hydato-genetic, in various recent publications, was deprecated. It was asked 'what are the criteria by which ore deposits are known to be deposited by gaseous solutions?' If this question can not be satisfactorily answered, what can be said as to the criteria upon which ores deposited by gaseous solutions are again subdivided? The placing of various ore deposits of many well-known districts in such classes as fumarolic solfataric, pneumatolytic, etc., without giving evidence for such a distribution, seemed to the speaker to be premature.

The criteria by which ores deposited by aqueous solutions may be discriminated were briefly summarized and the conclusion reached, from the application of these criteria, that this class of ore deposits is one of greater importance to men than any other class, and probably of greater importance than all other classes.

W. C. MENDENHALL,

Secretary.

ENTOMOLOGICAL SOCIETY OF WASHINGTON.

THE 175th regular meeting was held on February 19, 1903, fourteen members present.

Mr. William H. Ashmead was elected vice-president of the Washington Academy of Sciences for the Entomological Society.

Mr. Ashmead exhibited two species of wasps from Chile. The first, *Agenia xanthopus* Spinola, is remarkable because of the very short wings possessed by both sexes. This species is a synonym of *Pompilus gravesii* Haliday and will fall into the genus *Sphictostethus* of Kohl. The other species was *Cosila chilensis* Spinola, the type of Mr. Ashmead's family Cosilidæ.

Dr. Dyar presented the description of a new genus and species of Geometrid moths from Stockton, Utah, exhibiting specimens. He presented, further, a synoptic table for separating the North American white-marked species of *Eucosma*, a genus of moths belonging to the family Tortricidæ, with the description of a new species from Colorado. Dr. Dyar showed also a copy of Volume VII, Number 1, of *The Insect World*, the entomological magazine published in Japanese by Y. Nawa, which contains a colored plate of a moth and larva parasitic upon a leaf-hopper belonging to the homopterous family Fulgoridæ. He said that this was of special interest in connection with the species found by Messrs. Schwarz and Barber in New Mexico and which he had recently described before the society as a new species, *Epipyrops barberiana*. The moth figured by Mr. Nawa seems to be also an *Epipyrops*. It is not yet clearly known what is the food of these larvæ. Westwood supposed that they fed upon the white secretion of the Fulgorids, but Mr. Nawa, in his account of the Japanese species, stated that the larvæ secreted a white covering, and Dr. Dyar did not think it reasonable that the larvæ should secrete a substance sim-

ilar to their own food. As there was but little of this pruinose matter on the host, certainly not enough to support several larvæ, he inclined to the opinion that the *Epipyrops* larvæ might prove to be true parasites.

Mr. Simpson showed a micro-photograph of sections of the eversible gland of the Io moth larva (*Automeris io* Fabricius). He stated that, in exceptional specimens, this gland was missing.

A paper by Mr. August Busck, 'Notes on Brackenridge Clemens's Types of Tineina,' was presented. It consisted of detailed studies of Dr. Clemens's types of Microlepidoptera in the Academy of Natural Sciences of Philadelphia, resulting in the identification of all but eight of his 200 species. Of these eight, five have been identified with certainty from the descriptions.

Mr. Ashmead spoke on 'Some Remarkable New Genera in Cynipoidea,' exhibiting specimens of nine new genera of gall-wasps from Brazil and California, and commenting upon their peculiarities.

Dr. Dyar presented the first part of a 'List of Lepidoptera taken at Williams, Arizona, by Messrs. Schwarz and Barber.' The list included 139 species, fifteen of which were described as new.

A paper by Mr. A. N. Caudell, 'Notes on the Nomenclature of Blattidæ' (cockroaches), dealt with the question of determining the type species of the Linnæan genus *Blatta*. The author showed that Latreille, before any of the old species had been removed from the genus, designated *Blatta orientalis* as the type. He proposed a new generic name for the 'croton bug,' *Phyllodromia* being preoccupied in the Diptera.

The three following papers were read by title: 'Neuropteroid Insects from Arizona,' by Nathan Banks; 'The Genera of the Dipterous Family Empididæ, with Notes and New Species,' by D. W. Coquillett; 'Myrmeleonidæ from Arizona,' by Rolla P. Currie.

ROLLA P. CURRIE,
Recording Secretary.

NEW YORK ACADEMY OF SCIENCES.

SECTION OF BIOLOGY.

At the February meeting papers by Dr. W. A. Cannon, Professor Bashford Dean and Professor H. F. Osborn were presented.

Dr. Cannon's paper, 'Cytological Studies of Variation in Hybrids,' was based upon his studies of hybrids of cotton plants, and discussed the relation between the maturation mitoses in hybrids and the variation of the hybrid race. Two forms of mitosis occur in fertile hybrids. One of these is the normal type, which occurs in pure races and may be supposed to give rise to reproductive cells of pure descent. This is the form in hybrids between closely related parents (monohybrids), and probably forms the basis for the regular reversion in them. The other type of mitosis is irregular. It is suggested that this kind of maturation mitosis may organize cells of mixed descent, and if found in hybrids from parents rather distantly related, would constitute the basis for such mixture of the characters of the pure parents as occurs in these hybrids. However, after the characters have become mixed in all possible proportions, and the limit of variation thus reached, normal mitoses probably occur. Thus it appears that the mingling of the characters, as well as the regular reversion in hybrids, may have a morphological basis.

Professor Dean, in a paper entitled 'Past and Present Study of Zoology in Japan,' first reviewed the history of the study of zoology, and then considered the present status of zoological investigation and teaching in that country. With the aid of lantern illustration, descriptions were given of the laboratories, the fauna available for study, and the prominent Japanese workers.

Professor Osborn's paper, 'On the Primary Divisions of the Reptilia into Two Subclasses,' was presented by Dr. Hay. This has been published in full in *SCIENCE* for February 13, 1903.

THE third meeting of the year was held at the American Museum of Natural History on March 9, Professor Bashford Dean presiding. The following papers were presented:

Mr. W. S. Sutton, in a paper on 'Chromosomic Reduction in its Relation to Mendel's Law,' pointed out that the processes of synapsis and reduction in the germ-cells of the grasshopper, *Brachystola*, are such as to indicate strongly that they are the causes of the character-reduction which forms the basis of the Mendelian principle of heredity. Probably the reducing division in *Brachystola* does not effect a separation of chromosomes into maternal and paternal groups, but the chromosome-series of the mature germ-cells is made up of a chance combination of chromosomes from the two parents. This is in accord with the results of Mendel and others who have shown that hybrid offspring exhibit a chance combination of characters from the two parental lines.

Professor Graham Lusk discussed the 'Influence of Nutrition on the Growth of Young Mammals,' basing this paper upon experiments conducted in his laboratory by Dr. Margaret B. Wilson (*Amer. Jour. Phy.*, VIII, 197, 1902), whose results support his own earlier work. It was shown that new-born pigs develop normally when fed with skimmed cow's milk, or with the same milk to which three per cent. of dextrose or lactose has been added. The growth is proportional to the calorific value of the food—always supposing sufficient proteid to be present. This agrees with the results of other workers who have studied the growth of children and other young mammals. The growth of the pigs was on the average about 215 grams growth for 1,000 calories in the food. Eighteen to nineteen per cent. of the energy of the food was retained in the body as new tissue.

The third paper, 'On the Colors and Color-Patterns of Certain Bermuda Fishes,' by Professor C. L. Bristol, dealt with correlations between habits and appearance with reference to warning and protective coloration of these fishes. An abstract will soon appear in SCIENCE in the proceedings of the American Morphological Society. M. A. BIGELOW,
Secretary.

KANSAS ACADEMY OF SCIENCE.

THE 35th annual meeting of the Kansas Academy of Science was held in the Museum

room of the academy at Topeka, December 31, 1902, and January 1 and 2, 1903. There was a large attendance of members and twenty-five new members were elected. The reports of the officers for the past year showed that the academy was in a prosperous condition. New and comfortable quarters have been recently given to the academy by the state.

These rooms are in the Capitol building at Topeka and include office and museum rooms, well furnished. At the sessions of the academy forty-three papers were presented on biological, chemical, geological and physical subjects. Most of these papers will appear in the eighteenth volume of the academy *Transactions*, now in press.

Among the papers presented, the following might perhaps be noted as of general interest: 'The Flora of Kansas,' by B. B. Smyth and J. H. Schaffner; 'Further Notes on Loco Weed,' by L. E. Sayre; 'Food Habits of California Sea Lions,' by L. L. Dyche; 'Ionic Velocities in Liquid Ammonia Solutions,' by E. C. Franklin; 'Crystalline Liquids,' by Fred S. Porter; 'Examination of Some Kansas Petroleum,' by Edw. Bartow and E. V. McCollum; 'The Extent and Thickness of the Oklahoma Gypsum,' by C. N. Gould; 'On the Alkyl Sulphates,' by F. W. Bushong; 'The New Washburn College Telescope,' by H. I. Woods; 'Experiences with Early Man,' by Chas. H. Sternberg.

A number of valuable papers on Kansas entomology were presented by two Kansas authorities, Warren Knaus and Dr. F. H. Snow. The disputed subject of gold in Kansas was discussed in a paper by Professor J. T. Lovewell. The public address was given by the retiring president, J. T. Willard, on the subject, 'The Mission and Limitations of Science.'

The following were elected officers for 1903:

President—J. C. Cooper, Topeka.

Vice-Presidents—Edward Bartow, Lawrence, and J. A. Yates, Ottawa.

Treasurer—Alva J. Smith, Emporia.

Secretary—G. P. Grimsley, Topeka.

The next meeting of the academy will be held near the close of 1903 at Manhattan.

It was decided to revise and enlarge the exchange list of the academy *Transactions*.

G. P. GRIMSLEY,
Secretary.

DISCUSSION AND CORRESPONDENCE.

THE ACTIVITY OF MONT PELÉE.

THE generally friendly tone of your reviewer's (T. A. J., Jr.) notice of my 'Mont Pelée and the Tragedy of Martinique' makes it almost ungenerous on my part to take exception to any of the statements that this notice contains. There is one point, however, dealing directly with the physics of Mont Pelée, that seems to me to deserve attention from its bearing upon volcanic phenomena generally. Your reviewer takes strong exception to the use that I have made of Russell's formula in computing the cubical content of the ash-cloud, and remarks that the defect in my reasoning 'lies in the assumption that a primary eruption is continuous for days or even hours.' The somewhat surprising statement follows that: "Professor Heilprin has failed to discriminate primary and secondary eruptions when he talks of Mt. Pelée 'being in a condition of forceful activity for upwards of 200 days.'" This does scant justice to my powers of observation, for it takes no scientist to separate or discriminate between the two classes of phenomena, any more than it requires a scientific eye to note the difference between the explosion of a dripping drop from a 'boiling kettle' and the 'blow' that issues from the snout. I fear that Dr. Jaggar has not seen Pelée in 'Pelée's glory,' otherwise he could hardly have hazarded the statement to which attention is called, and still less the subsequent one that 'the reviewer questions whether the volcano has been forcefully active from great depths for that many [200] minutes.' Had Mr. Jaggar been on the island of Martinique at any time during the days August 25 to September 3, inclusive, his conception of a 'primary eruption' would be very different from what it manifestly now is—he would have seen a raging central eruption continuous for that time, and not a

landscape of 'tremendous puffs that rise many thousand feet.'

When I prepared the chapter of my book which contains the calculations to which my reviewer takes exception, I was unaware of the conditions of the volcano which followed after my leaving the island. These are in many ways most interesting, and tend to confirm my conclusions as to the extraordinary quantity of the sedimental discharge from Pelée. The continuous activity of the volcano has been such that in the interval between the first week in September and the middle of December the mountain had increased its height by nearly or quite 900 feet (!), the needled summit of the cone (which had united with the old crater wall) being on December 16, as measured by Lacroix, 4,995 feet above sea-level. Much of this has since been destroyed, but Pelée is still at its work, adding to the 300 feet of ash that it has already laid down in parts of the valley of the Rivière Blanche. I do not think that the volcano can be seriously accused of working in working times of 'five or ten minutes.' In the days of the August-September activity, I feel satisfied—although necessarily lacking the means of *proving* the accuracy of my belief—that the continuous ash-discharge could not have been less than twenty per cent. of the measure of the steam-cloud; it may have been very much more.

ANGELO HEILPRIN.

PHILADELPHIA, PA.,
March 17, 1903.

THE PUBLICATION OF REJECTED NAMES.

I AM glad to see Mr. Bather's letter, although I can not altogether agree with what he says. My view is that if a description appears, accompanied by two or more names in the same publication, all being simultaneous in point of time, nothing but 'priority of place' can furnish a certain and invariable rule for selecting the one to be retained. I do not want to disturb existing rules, but I do want to see the same rules in use for all groups of animals and plants. My objection to the action of Messrs. Banks and Knowlton was based on the fact that they seemed to me